Fig.1
Related Art

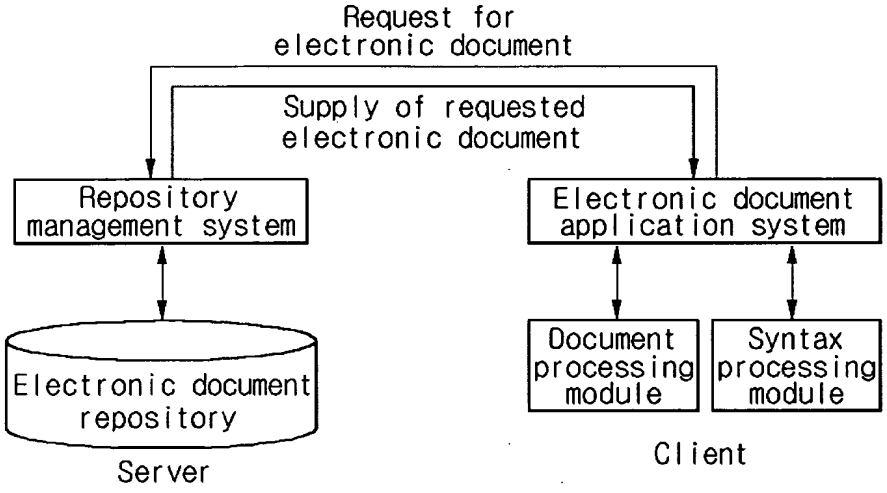

Fig.2
Related Art

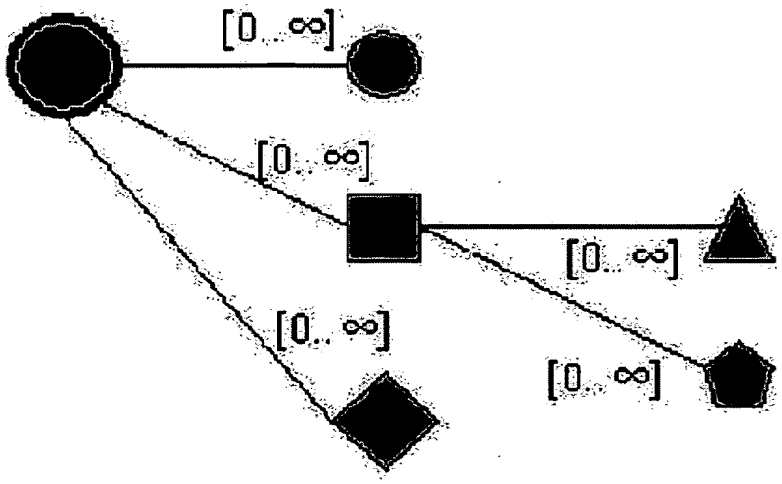

Fig.3

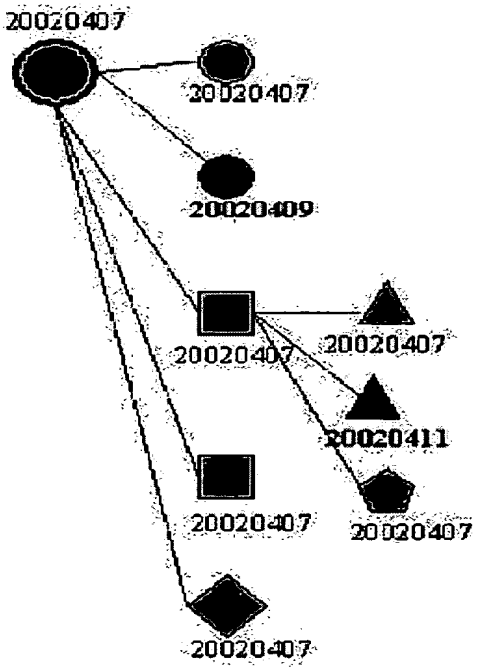
20020407
20020407
20020409
20020407
20020407
20020411
20020407
20020407
20020407

Fig.4

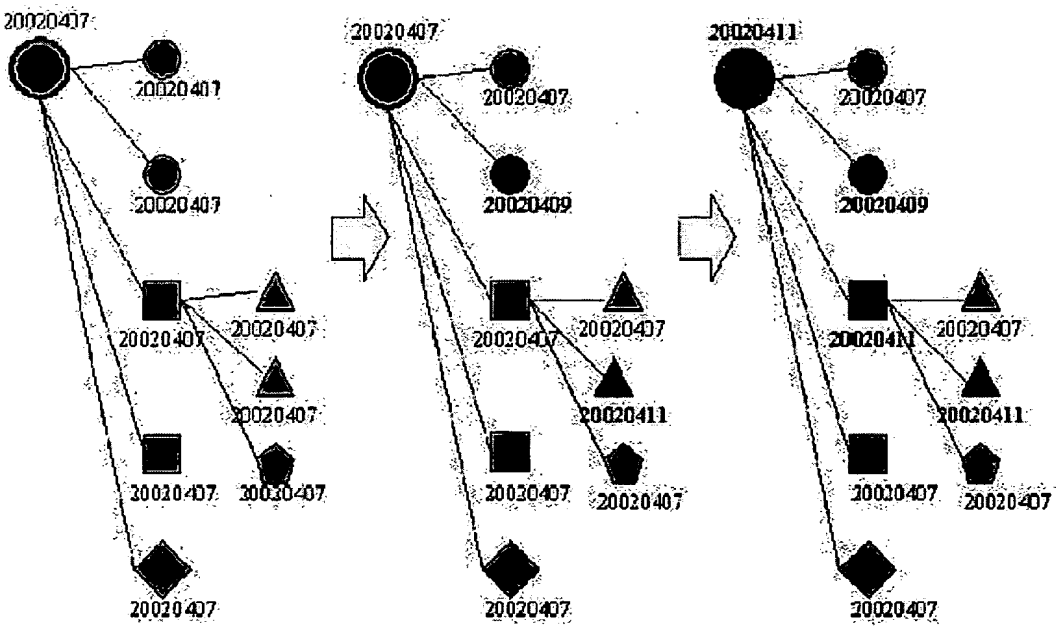
20020407
20020407
20020407
20020407
20020407
20020407
20020407
20020407
20020407
20020407
20020407
20020409
20020407
20020407
20020411
20020407
20020407
20020407
20020411
20020411
20020409
20020407
20020411
20020407
20020411
20020407
20020407

Fig.5

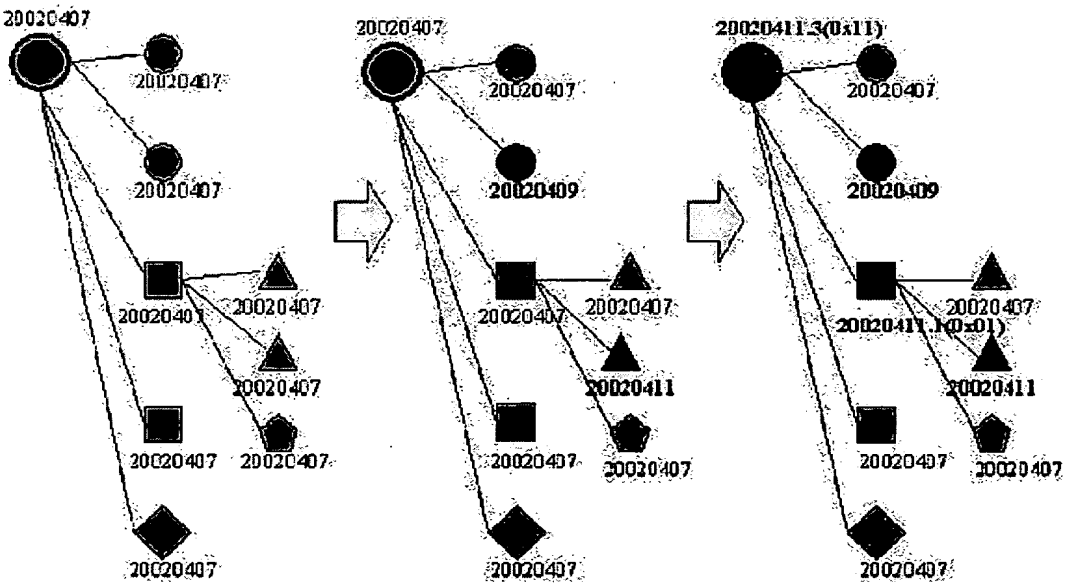
20020407
20020407
20020407
20020407
20020407
20020407
20020407
20020407
20020407
20020407
20020407
20020409
20020407
20020407
20020411
20020407
20020407
20020407
20020411.3(0x11)
20020407
20020409
20020407
20020407
20020411.1(0x01)
20020411
20020407
20020407

Fig.6

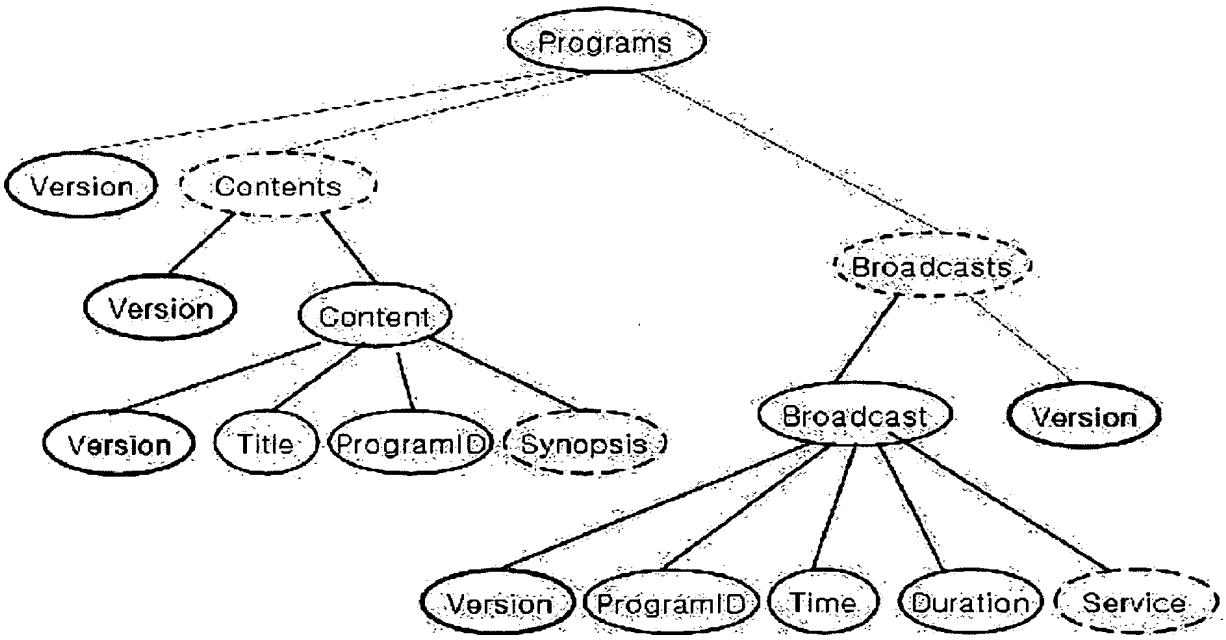
Programs
Version
Contents
Broadcasts
Version
Content
Version
Title
ProgramID
Synopsis
Broadcast
Version
Version
ProgramID
Time
Duration
Service

Fig.7

```
<?xml version="1.0" encoding="UTF-8"?>
<!ELEMENT Programs (Version, Contents?, Broadcasts?)>
<!ELEMENT Contents (Version, Content+)>
<!ELEMENT Content (Version, Title, ProgramID, Synopsis?)>
<!ELEMENT Version (#PCDATA)>
<!ELEMENT Title (#PCDATA)>
<!ELEMENT ProgramID (#PCDATA)>
<!ELEMENT Synopsis (#PCDATA)>
<!ELEMENT Broadcasts (Version, Broadcasts+)>
<!ELEMENT Broadcast (Version, ProgramID, Time, Duration, Service?)>
<!ELEMENT Time (#PCDATA)>
<!ELEMENT Duration (#PCDATA)>
<!ELEMENT Service (#PCDATA)>
```

Fig.8

```
<?xml version="1.0" encoding="UTF-8" ?>
<schema targetNamespace="http://www.sbs.co.kr"
        xmlns="http://www.w3.org/2001/XMLSchema"
        elementFormDefault="unqualified">
  <import namespace="http://www.w3c.org/XML/1998/namespace"
          schemaLocation="./xml-1998.xsd" />
  <element name="Programs">
    <complexType> <sequence>
      <element name="Version" type="string">
      <element name="Contents minOccurs="0">
        <complexType> <sequence>
            <element name="Version" type="string">
            <element name="Content" maxOccurs="unbounded">
              <complexType> <sequence>
                  <element name="Version" type="string">
                  <element name="Title"/>
                  <element name="ProgramID"/>
                  <element name="Synopsis" minOccurs="0">
                </sequence> </complexType> </element>
          </sequence> </complexType> </element>
      <element name="Broadcasts" minOccurs="0">
        <complexType> <sequence>
            <element name="Version" type="string">
            <element name="Broadcast" maxOccurs="unbounded">
              <complexType> <sequence>
                  <element name="Version" type="string">
                  <element name="ProgramID"/>
                  <element name="Time" type="dateTime"/>
                  <element name="Duration" type="dateTime"/>
                  <element name="Service" minOccurs="0"/>
                </sequence> </complexType> </element>
          </sequence> </complexType> </element>
      </sequence> </complexType> </element>
</schema>
```

Fig.9

```
<?xml version="1.0" encoding="UTF-8" ?>
<Programs>
  <Version>20020407</Version>
  <Contents>
    <Version>20020407</Version>
    <Content>
      <Version>20020407</Version> <Title>Friends</Title>
      <ProgramID>KTLA-2002-0324</ProgramID> </Content>
    <Content>
      <Version>20020407</Version> <Title>Will & Grace</Title>
      <ProgramID>KTLA-2002-0391</ProgramID> </Content>
    <Content>
      <Version>20020407</Version> <Title>MAJOR LEAGUE BASEBALL</Title>
      <ProgramID>ESPN-2002-0114</ProgramID> </Content>
    <Content>
      <Version>20020407</Version> <Title> Sesame Street </Title>
      <ProgramID>KCET-2002-0115</ProgramID> </Content>
  </Contents>
  <Broadcasts>
    <Version>20020407</Version>
    <Broadcast>
      <Version>20020407</Version> <ProgramID>KTLA-2002-0324</ProgramID>
      <Time>2002-04-22 21:55</Time> <Duration>110m</Duration>
      <Service>KTLA</Service> </Broadcast>
    <Broadcast>
      <Version>20020407</Version> <ProgramID>KTLA-2002-0391</ProgramID>
      <Time>2002-04-29 21:55</Time> <Duration>70m</Duration>
      <Service>KTLA</Service> </Broadcast>
    <Broadcast>
      <Version>20020407</Version> <ProgramID>ESPN-2002-0114</ProgramID>
      <Time>2002-04-09 15:00</Time> <Duration>120m</Duration>
      <Service>ESPN</Service> </Broadcast>
    <Broadcast>
      <Version>20020407</Version> <ProgramID>KCET-2002-0115</ProgramID>
      <Time>2002-04-09 17:00</Time> <Duration>30m</Duration>
      <Service>KCET</Service> </Broadcast>
  </Broadcasts>
</Programs>
```

Fig.10

```
<?xml version="1.0" encoding="UTF-8" ?>
<Programs>
  <Version>20020407</Version>
  <Contents>
    <Version>20020407</Version>
    <Content>
      <Version>20020407</Version> <Title>Friends</Title>
      <ProgramID>KTLA-2002-0324</ProgramID> </Content>
    <Content>
      <Version>20020407</Version> <Title>Will & Grace</Title>
      <ProgramID>KTLA-2002-0391</ProgramID> </Content>
    <Content>
      <Version>20020407</Version> <Title> MAJOR LEAGUE BASEBALL </Title>
      <ProgramID>ESPN-2002-0114</ProgramID> </Content>
    <Content>
      <Version>20020407</Version> <Title>Sesame Street</Title>
      <ProgramID>KCET-2002-0115</ProgramID> </Content>
    <Content>
      <Version>20020408</Version> <Title>Larry King</Title>
      <ProgramID>CNN-2002-0394</ProgramID> </Content>
  </Contents>
  <Broadcasts>
  <Version>20020407</Version>
    <Broadcast>
      <Version>20020407</Version> <ProgramID>KTLA-2002-0324</ProgramID>
      <Time>2002-04-22 21:55</Time> <Duration>110m</Duration>
      <Service>KTLA</Service> </Broadcast>
    <Broadcast>
      <Version>20020407</Version> <ProgramID>KTLA-2002-0391</ProgramID>
      <Time>2002-04-29 21:55</Time> <Duration>70m</Duration>
      <Service>KTLA</Service> </Broadcast>
    <Broadcast>
      <Version>20020409</Version> <ProgramID>ESPN-2002-0114</ProgramID>
      <Time>2002-04-09 15:00</Time> <Duration>130m</Duration>
      <Service>ESPN</Service> </Broadcast>
    <Broadcast>
      <Version>20020409</Version> <ProgramID>KCET-2002-0115</ProgramID>
      <Time>2002-04-09 17:10</Time> <Duration>30m</Duration>
      <Service>KCET</Service> </Broadcast>
    <Broadcast>
      <Version>20020408</Version> <ProgramID>CNN-2002-0394</ProgramID>
      <Time>2002-04-19 00:55</Time> <Duration>60m</Duration>
      <Service>CNN</Service> </Broadcast>
  </Broadcasts>
</Programs>
```

Fig.11

```
<?xml version="1.0" encoding="UTF-8" ?>
<Programs>
  <Version>20020409</Version>
  <Contents>
    <Version>20020409</Version>
    <Content>
      <Version>20020407</Version> <Title>Friends</Title>
      <ProgramID>KTLA-2002-0324</ProgramID> </Content>
    <Content>
      <Version>20020407</Version> <Title>Will & Grace</Title>
      <ProgramID>KTLA-2002-0391</ProgramID> </Content>
    <Content>
      <Version>20020407</Version> <Title> MAJOR LEAGUE BASEBALL </Title>
      <ProgramID>ESPN-2002-0114</ProgramID> </Content>
    <Content>
      <Version>20020407</Version> <Title>Sesame Street</Title>
      <ProgramID>KCET-2002-0115</ProgramID> </Content>
     <Content>
       <Version>20020408</Version> <Title>Larry King</Title>
       <ProgramID>CNN-2002-0394</ProgramID> </Content>
  </Contents>
  <Broadcasts>
    <Version>20020409</Version>
    <Broadcast>
      <Version>20020407</Version> <ProgramID>KTLA-2002-0324</ProgramID>
      <Time>2002-04-22 21:55</Time> <Duration>110m</Duration>
      <Service>KTLA</Service> </Broadcast>
    <Broadcast>
      <Version>20020407</Version> <ProgramID>LTLA-2002-0391</ProgramID>
      <Time>2002-04-29 21:55</Time> <Duration>70m</Duration>
      <Service>KTLA</Service> </Broadcast>
    <Broadcast>
      <Version>20020409</Version> <ProgramID>ESPN-2002-0114</ProgramID>
      <Time>2002-04-09 15:00</Time> <Duration>130m</Duration>
      <Service>ESPN</Service> </Broadcast>
    <Broadcast>
      <Version>20020409</Version> <ProgramID>KCET-2002-0115</ProgramID>
      <Time>2002-04-09 17:10</Time> <Duration>30m</Duration>
      <Service>KCET</Service> </Broadcast>
     <Broadcast>
       <Version>20020408</Version> <ProgramID>CNN-2002-0394</ProgramID>
       <Time>2002-04-19 00:55</Time> <Duration>60m</Duration>
       <Service>CNN</Service> </Broadcast>
  </Broadcasts>
</Programs>
```

Fig.12

```
<?xml version="1.0" encoding="UTF-8" ?>
<Programs>
  <Version>20020409.3</Version>
  <Contents>
    <Version>20020409.1</Version>
    <Content>
      <Version>20020407</Version> <Title>Friends</Title>
      <ProgramID>KTLA-2002-0324</ProgramID> </Content>
    <Content>
      <Version>20020407</Version> <Title>Will & Grace</Title>
      <ProgramID>KTLA-2002-0391</ProgramID> </Content>
    <Content>
      <Version>20020407</Version> <Title> MAJOR LEAGUE BASEBALL </Title>
      <ProgramID>ESPN-2002-0114</ProgramID> </Content>
    <Content>
      <Version>20020407</Version> <Title>Sesame Street</Title>
      <ProgramID>KCET-2002-0115</ProgramID> </Content>
    <Content>
      <Version>20020408</Version> <Title>Larry King</Title>
      <ProgramID>CNN-2002-0394</ProgramID> </Content>
  </Contents>
  <Broadcasts>
    <Version>20020409.1</Version>
    <Broadcast>
      <Version>20020407</Version> <ProgramID>KTLA-2002-0324</ProgramID>
      <Time>2002-04-22 21:55</Time> <Duration>110m</Duration>
      <Service>KTLA</Service> </Broadcast>
    <Broadcast>
      <Version>20020407</Version> <ProgramID>KTLA-2002-0391</ProgramID>
      <Time>2002-04-29 21:55</Time> <Duration>70m</Duration>
      <Service>KTLA</Service> </Broadcast>
    <Broadcast>
      <Version>20020409</Version> <ProgramID>ESPN-2002-0114</ProgramID>
      <Time>2002-04-09 15:00</Time> <Duration>130m</Duration>
      <Service>ESPN</Service> </Broadcast>
    <Broadcast>
      <Version>20020409</Version> <ProgramID>KCET-2002-0115</ProgramID>
      <Time>2002-04-09 17:10</Time> <Duration>30m</Duration>
      <Service>KCET</Service> </Broadcast>
    <Broadcast>
      <Version>20020408</Version> <ProgramID>CNN-2002-0394</ProgramID>
      <Time>2002-04-19 00:55</Time> <Duration>60m</Duration>
      <Service>CNN</Service> </Broadcast>
  </Broadcasts>
</Programs>
```

Fig.13

```
<?xml version="1.0" encoding="UTF-8" ?>
<Programs>
  <Version>20020407</Version>
  <Contents>
    <Version>20020407</Version>
    <Content>
      <Version>20020408</Version>
      <Title>Larry King</Title>
      <ProgramID>CNN-2002-0394</ProgramID>
    </Content>
  </Contents>
  <Broadcasts>
  <Version>20020407</Version>
    <Broadcast>
      <Version>20020409</Version>
      <ProgramID>ESPN-2002-0114</ProgramID>
      <Time>2002-04-09 15:00</Time>
      <Duration>130m</Duration>
      <Service>ESPN</Service>
    </Broadcast>
    <Broadcast>
      <Version>20020409</Version>
      <ProgramID>KCET-2002-0115</ProgramID>
      <Time>2002-04-09 17:10</Time>
      <Duration>30m</Duration>
      <Service>KCET</Service>
    </Broadcast>
    <Broadcast>
      <Version>20020408</Version>
      <ProgramID>CNN-2002-0394</ProgramID>
      <Time>2002-04-19 00:55</Time>
      <Duration>60m</Duration>
      <Service>CNN</Service>
    </Broadcast>
  </Broadcasts>
</Programs>
```

Fig.14

```
<?xml version="1.0" encoding="UTF-8" ?>
<Programs>
  <Version>20020409</Version>
  <Contents>
    <Version>20020409</Version>
    <Content>
      <Version>20020408</Version>
      <Title>Larry King</Title>
      <ProgramID>CNN-2002-0394</ProgramID>
    </Content>
  </Contents>
  <Broadcasts>
    <Version>20020409</Version>
    <Broadcast>
      <Version>20020409</Version>
      <ProgramID>ESPN-2002-0114</ProgramID>
      <Time>2002-04-09 15:00</Time>
      <Duration>130m</Duration>
      <Service>ESPN</Service>
    </Broadcast>
    <Broadcast>
      <Version>20020409</Version>
      <ProgramID>KCET-2002-0115</ProgramID>
      <Time>2002-04-09 17:10</Time>
      <Duration>30m</Duration>
      <Service>KCET</Service>
    </Broadcast>
    <Broadcast>
      <Version>20020408</Version>
      <ProgramID>CNN-2002-0394</ProgramID>
      <Time>2002-04-19 00:55</Time>
      <Duration>60m</Duration>
      <Service>CNN</Service>
    </Broadcast>
  </Broadcasts>
</Programs>
```

Fig.15

```
<?xml version="1.0" encoding="UTF-8" ?>
<Programs>
  <Version>20020407</Version>
  <Broadcasts>
  <Version>20020407</Version>
    <Broadcast>
      <Version>20020409</Version>
      <ProgramID>ESPN-2002-0114</ProgramID>
      <Time>2002-04-09 15:00</Time>
      <Duration>130m</Duration>
      <Service>ESPN</Service>
    </Broadcast>
    <Broadcast>
      <Version>20020409</Version>
      <ProgramID>KCET-2002-0115</ProgramID>
      <Time>2002-04-09 17:10</Time>
      <Duration>30m</Duration>
      <Service>KCET</Service>
    </Broadcast>
    <Broadcast>
      <Version>20020408</Version>
      <ProgramID>CNN-2002-0394</ProgramID>
      <Time>2002-04-19 00:55</Time>
      <Duration>60m</Duration>
      <Service>CNN</Service>
    </Broadcast>
  </Broadcasts>
</Programs>
```

Fig.16

```
<?xml version="1.0" encoding="UTF-8" ?>
<Programs>
  <Version>20020409</Version>
  <Broadcasts>
    <Version>20020409</Version>
    <Broadcast>
      <Version>20020409</Version>
      <ProgramID>ESPN-2002-0114</ProgramID>
      <Time>2002-04-09 15:00</Time>
      <Duration>130m</Duration>
      <Service>ESPN</Service>
    </Broadcast>
    <Broadcast>
      <Version>20020409</Version>
      <ProgramID>KCET-2002-0115</ProgramID>
      <Time>2002-04-09 17:10</Time>
      <Duration>30m</Duration>
      <Service>KCET</Service>
    </Broadcast>
    <Broadcast>
      <Version>20020408</Version>
      <ProgramID>CNN-2002-0394</ProgramID>
      <Time>2002-04-19 00:55</Time>
      <Duration>60m</Duration>
      <Service>CNN</Service>
    </Broadcast>
  </Broadcasts>
</Programs>
```

Fig.17

```
<?xml version="1.0" encoding="UTF-8"?>
<Invalid>
  <Programs>
    <Broadcast>
      <Version>20020110</Version>
      <ProgramID>CNN-2002-0394</ProgramID>
    </Broadcast>
  </Programs>
</Invalid>
<Programs>
  <Version>20020407</Version>
  <Broadcasts>
  <Version>20020407</Version>
    <Broadcast>
      <Version>20020409</Version>
      <ProgramID>ESPN-2002-0114</ProgramID>
      <Time>2002-04-09 15:00</Time>
      <Duration>130m</Duration>
      <Service>ESPN</Service>
    </Broadcast>
    <Broadcast>
      <Version>20020409</Version>
      <ProgramID>KCET-2002-0115</ProgramID>
      <Time>2002-04-09 17:10</Time>
      <Duration>30m</Duration>
      <Service>KCET</Service>
    </Broadcast>
    <Broadcast>
      <Version>20020408</Version>
      <ProgramID>CNN-2002-0394</ProgramID>
      <Time>2002-04-19 00:55</Time>
      <Duration>60m</Duration>
      <Service>CNN</Service>
    </Broadcast>
  </Broadcasts>
</Programs>
```

Fig. 18

```
<?xml version="1.0" encoding="UTF-8"?>
<Invalid>
  <Programs>
    <Broadcast>
      <Version>20020110</Version>
      <ProgramID>CNN-2002-0394</ProgramID>
    </Broadcast>
  </Programs>
</Invalid>
<Programs>
  <Version>20020409</Version>
  <Broadcasts>
  <Version>20020409</Version>
    <Broadcast>
      <Version>20020409</Version>
      <ProgramID>ESPN-2002-0114</ProgramID>
      <Time>2002-04-09 15:00</Time>
      <Duration>130m</Duration>
      <Service>ESPN</Service>
    </Broadcast>
    <Broadcast>
      <Version>20020409</Version>
      <ProgramID>KCET-2002-0115</ProgramID>
      <Time>2002-04-09 17:10</Time>
      <Duration>30m</Duration>
      <Service>KCET</Service>
    </Broadcast>
    <Broadcast>
      <Version>20020408</Version>
      <ProgramID>CNN-2002-0394</ProgramID>
      <Time>2002-04-19 00:55</Time>
      <Duration>60m</Duration>
      <Service>CNN</Service>
    </Broadcast>
  </Broadcasts>
</Programs>
```